

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim 1 has been amended to recite that the bag according to the present invention comprises a laminate of a biaxially oriented film of which the major component is a polylactic acid-family polymer, and a film consisting of an aliphatic polyester having the structure of formula (1) and having a crystallizing melting heat ΔH_m (J/g) of $45 \leq \Delta H_m \leq 55$.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

The rejection of claims 1 and 3 under 35 U.S.C. §103(a) as being unpatentable over Ebato et al. is respectfully traversed.

The Examiner takes the position that Ebato et al. teach a biodegradable bag comprising a laminate, wherein the entire film including both layers is biaxially oriented by the tenter method. The Examiner further asserts that the second layer is degradable polymer, and the first layer consists of a block copolymer of an aliphatic polyester formed from chain-hydrocarbon and/or alicyclic-hydrocarbon moieties containing the group -COO- such as the polyester described in formula (1) of Applicants' claim 1. The Examiner also states that the aliphatic polyester has a weight-average molecular weight between 10,000 and 250,000, the alkylene or cycloalkylene groups have a carbon number of 2-10, and the aliphatic polyester is a copolymer of butylene glycol or butanediol and succinic acid and adipic acid.

The Examiner admits that Ebato et al. fail to teach that the second layer or film of the laminate of which the major component is a polylactic acid-family polymer and is an outer layer. The Examiner asserts, however, that Ebato et al. teach that laminates are formed by laminating or heat sealing using the film described above as the first layer and a second film of degradable polymer, and that polylactic acid-family polymers are excellent degradable polymers and it is a desire of one skilled in the art to use polylactic acid-family polymers in forming biodegradable articles. The Examiner then takes the position that one of ordinary skill in the art would have recognized that a polylactic acid-family polymer is used as a degradable polymer when forming biodegradable articles such as

bags, because polylactic acid-family polymers have excellent biodegradability and it is a desire of one of ordinary skill in the art to use polylactic-acid family polymers in biodegradable articles.

However, Applicants have amended claim 1 to limit the first layer (Examiner's term) to one consisting of a particular aliphatic polyester of formula (1). Although Ebato et al. describe a block copolymer of a polylactic acid-family polymer and an aliphatic/ aromatic polyester, and a packaging material such as a film comprising this block copolymer, the reference does not describe a film consisting of the aliphatic polyester itself. It would not have been obvious to one skilled in the art to derive the laminate film according to the present invention, which comprises a film consisting of a specific aliphatic polyester, from a block copolymer of a polylactic acid-family polymer and an aliphatic/aromatic polyester. There is no teaching in Ebato et al. of a film consisting of an aliphatic polyester alone.

Additionally, as admitted by the Examiner, Ebato et al. do not teach that the second layer of the laminate, which has a polylactic acid-family polymer as the major component, is the outer layer. The Examiner asserts that Ebato et al. teach that laminates are formed by laminating or heat sealing using a block copolymer of an aliphatic polyester as the first layer and a second film of a degradable polymer. The Examiner further asserts that it would have been obvious to one skilled in the art to heat seal a film of which the major component is a polylactic acid-family polymer to the outer surface of the first layer. However, the passage relied upon by the Examiner does not support this assertion. The passage states "[i]t is also possible to laminate the copolyester to ... film of other degradable polymer by extrusion laminating, dry laminating, or co-extrusion." (See column 17, lines 30-32 of Ebato et al.) This passage does not provide any guidance as to which layer is the inner/outer layer of the laminate. Therefore, the teachings of Ebato et al. do not satisfy the limitation in Applicants' claim 1, which requires that the film of which the major component is a polylactic acid-family polymer is an outer layer.

Thus, Ebato et al. do not teach a biodegradable bag comprising a laminate of a biaxially oriented film of which the major component is a polylactic acid-family polymer, and a film consisting of an aliphatic polyester, wherein the film of which the major component is a polylactic acid-family

polymer is an outer layer. For these reasons, the invention of claims 1 and 3 is clearly patentable over Ebato et al.

The rejection of claims 2 and 4 under 35 U.S.C. §103(a) as being unpatentable over Ebato et al. in view of Takagi et al. is respectfully traversed.


The Examiner relies upon Ebato et al. for the same reasons applied in the rejection of claims 1 and 3 under 35 U.S.C. §103(a), discussed above. The Examiner admits that Ebato et al. fail to teach a zipper made of biodegradable resin which is provided at the mouth portion of the biodegradable bag. The Examiner further admits that Ebato et al. fail to teach that the biodegradable resin contains as the major component a polylactic acid-family polymer, an aliphatic polyester, or a mixture thereof. The Examiner asserts that Takagi et al. teach a biodegradable bag containing a laminate of polylactic acid-family polymers blended with aliphatic polyesters like Ebato et al., and that the bag has a fastener or zipper made of a biodegradable resin, which has the same basic structure as the aliphatic polyester used to form the bag itself. The Examiner further states that Takagi et al. teach that a zipper must be biodegradable in order for the entire bag to be environmentally friendly. The Examiner asserts that one of ordinary skill in the art would have recognized that a zipper is added to a biodegradable bag in which the zipper is formed from aliphatic polyester having the structure of formula (1) in Applicants' claim 1 in order for the bag to be fully biodegradable.

The comments set forth above in the discussion of the obviousness rejection of claims 1 and 3 concerning Ebato et al. are equally applicable to this rejection. Claims 2 and 4 are directly dependent on claims 1 and 3, which are patentable over Ebato et al. for the reasons discussed above. Takagi et al. do not remedy the deficiencies of Ebato et al., and therefore, the subject matter of claims 2 and 4 is patentable over Ebato et al. in view of Takagi et al. for the same reasons that the subject matter of claims 1 and 3 is patentable over Ebato et al. That is, even if the references were combined in the manner suggested by the Examiner, the result of such combination would still not suggest the subject matter of claims 2 and 4.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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